

5.0 Summary of Analytical Results

The results of the chemical analysis of samples collected at Training Area T-31, Parcels 184(7) and 185(7), indicate that metals, VOCs, and one SVOC were detected in various site media. CWM breakdown products were not detected in any of the samples collected at the site. To evaluate whether the detected constituents present an unacceptable risk to human health and the environment, the analytical results were compared to the human health SSSLs and ESVs for FTMC. The SSSLs and ESVs were developed by Shaw for human health and ecological risk evaluations as part of the ongoing SIs being performed under the BRAC Environmental Restoration Program at FTMC.

Metals concentrations exceeding the SSSLs and ESVs were subsequently compared to metals background screening values to determine if the metals concentrations are within natural background concentrations (SAIC, 1998). Site metals were further evaluated using statistical and geochemical methods to determine if the metals were site related (Appendix G).

The following sections and Tables 5-1 through 5-5 summarize the results of the comparison of detected constituents to the SSSLs, ESVs, and background screening values. Complete analytical results are presented in Appendix F.

5.1 Surface and Depositional Soil Analytical Results

Eight surface soil samples and three depositional soil samples were collected for chemical analysis at Training Area T-31, Parcels 184(7) and 185(7). Surface soil samples were collected from the uppermost foot of soil, and depositional soil samples were collected from the upper six inches of soil at the locations shown on Figure 3-1. Analytical results were compared to residential human health SSSLs, ESVs, and metals background screening values, as presented in Table 5-1.

Metals. A total of 21 metals were detected in the surface and depositional samples. The concentrations of five metals (aluminum, antimony, arsenic, iron, and manganese) exceeded SSSLs in one or more samples. Of these, only two metals also exceeded their respective background values in one sample each:

- Aluminum (20,200 milligrams per kilogram [mg/kg]) exceeded its SSSL (7,803 mg/kg) and background (16,306 mg/kg) at sample location CWM-185-DEP02.

Table 5-1

Surface and Depositional Soil Analytical Results
Training Area T-31, Parcels 184(7) and 185(7)
Fort McClellan, Calhoun County, Alabama

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Sample Location Sample Number Sample Date					CWM-184-DEP01 TL0011 08-Nov-01					CWM-184-MW01 TL0001 16-Oct-01					CWM-184-MW02 TL0003 16-Oct-01					CWM-184-MW03 TL0005 16-Oct-01				
Parameter	Units	BKG ^a	SSSL ^b	ESV ^b	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
METALS																								
Aluminum	mg/kg	1.63E+04	7.80E+03	5.00E+01	1.11E+04			YES	YES	3.55E+03				YES	1.13E+04			YES	YES	6.96E+03				YES
Antimony	mg/kg	1.99E+00	3.11E+00	3.50E+00	ND					4.62E+00	J	YES	YES	YES	ND					ND				
Arsenic	mg/kg	1.37E+01	4.26E-01	1.00E+01	2.28E+00			YES		8.62E-01	J		YES		3.61E+00			YES		1.65E+00			YES	
Barium	mg/kg	1.24E+02	5.47E+02	1.65E+02	1.71E+02		YES		YES	1.25E+01					4.54E+01					4.49E+01				
Beryllium	mg/kg	8.00E-01	9.60E+00	1.10E+00	1.10E+00	J	YES			ND					ND					ND				
Calcium	mg/kg	1.72E+03	NA	NA	7.79E+02					6.37E+01	B				5.16E+02					9.47E+02				
Chromium	mg/kg	3.70E+01	2.32E+01	4.00E-01	1.32E+01			YES		3.80E+00				YES	1.43E+01			YES		5.91E+00				YES
Cobalt	mg/kg	1.52E+01	4.68E+02	2.00E+01	5.23E+00					1.91E+00	J				2.46E+00					1.26E+00	J			
Copper	mg/kg	1.27E+01	3.13E+02	4.00E+01	1.11E+02		YES		YES	ND					4.19E+00					2.59E+00				
Iron	mg/kg	3.42E+04	2.34E+03	2.00E+02	9.77E+03			YES	YES	2.50E+03			YES	YES	1.02E+04			YES	YES	6.42E+03			YES	YES
Lead	mg/kg	4.01E+01	4.00E+02	5.00E+01	8.87E+01		YES		YES	5.27E+00					1.06E+01					1.02E+01				
Magnesium	mg/kg	1.03E+03	NA	4.40E+05	5.73E+02					1.50E+02					7.71E+02					3.44E+02				
Manganese	mg/kg	1.58E+03	3.63E+02	1.00E+02	3.58E+02				YES	4.07E+01					4.05E+01					1.17E+02				YES
Mercury	mg/kg	8.00E-02	2.33E+00	1.00E-01	4.00E-01		YES		YES	ND					ND					ND				
Nickel	mg/kg	1.03E+01	1.54E+02	3.00E+01	6.86E+00					1.73E+00	J				4.90E+00					3.12E+00				
Potassium	mg/kg	8.00E+02	NA	NA	6.11E+02					2.91E+02	B				5.88E+02	B				3.56E+02	B			
Selenium	mg/kg	4.80E-01	3.91E+01	8.10E-01	8.10E-01	J	YES			ND					ND					ND				
Silver	mg/kg	3.60E-01	3.91E+01	2.00E+00	1.71E+01		YES		YES	ND					ND					ND				
Sodium	mg/kg	6.34E+02	NA	NA	4.91E+01	B				ND					ND					ND				
Vanadium	mg/kg	5.88E+01	5.31E+01	2.00E+00	1.41E+01				YES	6.24E+00				YES	1.93E+01			YES		1.03E+01				YES
Zinc	mg/kg	4.06E+01	2.34E+03	5.00E+01	5.51E+01		YES		YES	5.41E+00	B				1.58E+01					1.47E+01				
VOLATILE ORGANIC COMPOUNDS																								
2-Butanone	mg/kg	NA	4.66E+03	8.96E+01	ND					5.00E-03	J				ND					ND				
2-Hexanone	mg/kg	NA	3.11E+02	1.26E+01	ND					ND					ND					ND				
Acetone	mg/kg	NA	7.76E+02	2.50E+00	9.70E-01	J				1.00E-01	J				4.30E-02	J				4.30E-02	J			
Chloroform	mg/kg	NA	1.03E+02	1.00E-03	ND					ND					ND					2.30E-03	J			YES
Methylene chloride	mg/kg	NA	8.41E+01	2.00E+00	ND					2.00E-03	B				1.60E-03	B				1.60E-03	B			
Tetrachloroethene	mg/kg	NA	1.21E+01	1.00E-02	ND					ND					ND					ND				
Toluene	mg/kg	NA	1.55E+03	5.00E-02	ND					ND					ND					ND				
Trichlorofluoromethane	mg/kg	NA	2.33E+03	1.00E-01	ND					ND					1.70E-03	J				ND				
p-Cymene	mg/kg	NA	1.55E+03	NA	2.60E-01	J				ND					ND					ND				
sec-Butylbenzene	mg/kg	NA	7.77E+01	NA	ND					ND					ND					ND				
SEMIVOLATILE ORGANIC COMPOUNDS																								
Bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	9.30E-01	1.30E-01	J				ND					ND					ND				

Table 5-1

**Surface and Depositional Soil Analytical Results
Training Area T-31, Parcels 184(7) and 185(7)
Fort McClellan, Calhoun County, Alabama**

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Sample Location Sample Number Sample Date					CWM-184-MW04 TL0007 16-Oct-01					CWM-184-MW05 TL0009 16-Oct-01					CWM-185-DEP01 TF0009 7-Nov-01					CWM-185-DEP02 TF0010 7-Nov-01				
Parameter	Units	BKG ^a	SSSL ^b	ESV ^c	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
METALS																								
Aluminum	mg/kg	1.63E+04	7.80E+03	5.00E+01	1.29E+04			YES	YES	1.08E+04			YES	YES	1.61E+04			YES	YES	2.02E+04		YES	YES	YES
Antimony	mg/kg	1.99E+00	3.11E+00	3.50E+00	ND					ND					ND					ND				
Arsenic	mg/kg	1.37E+01	4.26E-01	1.00E+01	2.37E+00			YES		2.83E+00			YES		2.38E+00			YES		4.26E+00			YES	
Barium	mg/kg	1.24E+02	5.47E+02	1.65E+02	4.03E+01					5.90E+01					1.12E+02					8.37E+01				
Beryllium	mg/kg	8.00E-01	9.60E+00	1.10E+00	ND					ND					7.33E-01	J				7.76E-01	J			
Calcium	mg/kg	1.72E+03	NA	NA	1.13E+02	J				1.73E+02					5.47E+02					4.23E+02				
Chromium	mg/kg	3.70E+01	2.32E+01	4.00E-01	1.53E+01				YES	1.60E+01				YES	1.66E+01				YES	2.11E+01				YES
Cobalt	mg/kg	1.52E+01	4.68E+02	2.00E+01	1.89E+00	J				3.75E+00					4.33E+00					6.01E+00				
Copper	mg/kg	1.27E+01	3.13E+02	4.00E+01	6.85E+00					3.00E+00					1.80E+01		YES			1.49E+01		YES		
Iron	mg/kg	3.42E+04	2.34E+03	2.00E+02	1.13E+04			YES	YES	1.28E+04			YES	YES	1.30E+04			YES	YES	1.75E+04			YES	YES
Lead	mg/kg	4.01E+01	4.00E+02	5.00E+01	1.02E+01					8.58E+00					1.93E+02		YES		YES	6.59E+01		YES		YES
Magnesium	mg/kg	1.03E+03	NA	4.40E+05	6.08E+02					6.20E+02					1.30E+03		YES			1.08E+03		YES		
Manganese	mg/kg	1.58E+03	3.63E+02	1.00E+02	1.62E+01					1.67E+02				YES	1.27E+02				YES	4.30E+02			YES	YES
Mercury	mg/kg	8.00E-02	2.33E+00	1.00E-01	3.30E-02	J				ND					3.55E-02	J				4.70E-02	J			
Nickel	mg/kg	1.03E+01	1.54E+02	3.00E+01	4.88E+00					4.50E+00					7.93E+00					1.02E+01				
Potassium	mg/kg	8.00E+02	NA	NA	7.91E+02					5.56E+02	B				1.62E+03		YES			1.12E+03		YES		
Selenium	mg/kg	4.80E-01	3.91E+01	8.10E-01	ND					ND					ND					ND				
Silver	mg/kg	3.60E-01	3.91E+01	2.00E+00	ND					ND					ND					ND				
Sodium	mg/kg	6.34E+02	NA	NA	ND					ND					5.10E+01	J				5.17E+01	J			
Vanadium	mg/kg	5.88E+01	5.31E+01	2.00E+00	2.71E+01				YES	1.79E+01				YES	2.69E+01				YES	3.63E+01				YES
Zinc	mg/kg	4.06E+01	2.34E+03	5.00E+01	1.53E+01					1.53E+01					3.33E+01					2.83E+01				
VOLATILE ORGANIC COMPOUNDS																								
2-Butanone	mg/kg	NA	4.66E+03	8.96E+01	ND					8.50E-03	J				8.60E-02	J				4.10E-02	J			
2-Hexanone	mg/kg	NA	3.11E+02	1.26E+01	ND					ND					9.80E-03	J				ND				
Acetone	mg/kg	NA	7.76E+02	2.50E+00	3.80E-02	J				1.20E-01	J				2.30E+00	J				6.20E-01	J			
Chloroform	mg/kg	NA	1.03E+02	1.00E-03	ND					ND					ND					ND				
Methylene chloride	mg/kg	NA	8.41E+01	2.00E+00	1.50E-03	B				1.40E-03	B				3.40E-03	B				1.90E-03	B			
Tetrachloroethene	mg/kg	NA	1.21E+01	1.00E-02	ND					ND					ND					ND				
Toluene	mg/kg	NA	1.55E+03	5.00E-02	ND					ND					1.60E-02	J				2.00E-03	J			
Trichlorofluoromethane	mg/kg	NA	2.33E+03	1.00E-01	1.90E-03	J				ND					3.00E-03	B				ND				
p-Cymene	mg/kg	NA	1.55E+03	NA	ND					ND					2.40E-01	J				3.30E-03	J			
sec-Butylbenzene	mg/kg	NA	7.77E+01	NA	ND					ND					ND					ND				
SEMI-VOLATILE ORGANIC COMPOUNDS																								
Bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	9.30E-01	ND					ND					ND					ND				

Table 5-1

**Surface and Depositional Soil Analytical Results
Training Area T-31, Parcels 184(7) and 185(7)
Fort McClellan, Calhoun County, Alabama**

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Sample Location Sample Number Sample Date					CWM-185-GP01 TF0007 16-Oct-01					CWM-185-MW01 TF0001 16-Oct-01					CWM-185-MW02 TF0003 16-Oct-01				
Parameter	Units	BKG ^a	SSSL ^b	ESV ^b	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV	Result	Qual	>BKG	>SSSL	>ESV
METALS																			
Aluminum	mg/kg	1.63E+04	7.80E+03	5.00E+01	1.06E+04			YES	YES	1.11E+04			YES	YES	5.92E+03				YES
Antimony	mg/kg	1.99E+00	3.11E+00	3.50E+00	ND					ND					ND				
Arsenic	mg/kg	1.37E+01	4.26E-01	1.00E+01	2.92E+00			YES		2.11E+00			YES		3.89E+00			YES	
Barium	mg/kg	1.24E+02	5.47E+02	1.65E+02	1.09E+02					7.84E+01					4.24E+01				
Beryllium	mg/kg	8.00E-01	9.60E+00	1.10E+00	6.04E-01	J				5.25E-01	J				ND				
Calcium	mg/kg	1.72E+03	NA	NA	3.00E+02	J				1.41E+02	J				3.16E+02	J			
Chromium	mg/kg	3.70E+01	2.32E+01	4.00E-01	9.28E+00				YES	9.32E+00				YES	6.97E+00				YES
Cobalt	mg/kg	1.52E+01	4.68E+02	2.00E+01	4.56E+00					2.50E+00					1.82E+00	J			
Copper	mg/kg	1.27E+01	3.13E+02	4.00E+01	7.56E+00					2.02E+00	J				ND				
Iron	mg/kg	3.42E+04	2.34E+03	2.00E+02	8.28E+03			YES	YES	6.59E+03			YES	YES	1.01E+04			YES	YES
Lead	mg/kg	4.01E+01	4.00E+02	5.00E+01	1.11E+01					1.04E+01					8.45E+00				
Magnesium	mg/kg	1.03E+03	NA	4.40E+05	6.44E+02					7.05E+02					3.33E+02				
Manganese	mg/kg	1.58E+03	3.63E+02	1.00E+02	4.88E+02			YES	YES	8.99E+01					8.76E+01				
Mercury	mg/kg	8.00E-02	2.33E+00	1.00E-01	ND					ND					ND				
Nickel	mg/kg	1.03E+01	1.54E+02	3.00E+01	5.10E+00					4.63E+00					2.38E+00	J			
Potassium	mg/kg	8.00E+02	NA	NA	6.17E+02	B				7.86E+02					3.93E+02	B			
Selenium	mg/kg	4.80E-01	3.91E+01	8.10E-01	ND					6.68E-01	J	YES			ND				
Silver	mg/kg	3.60E-01	3.91E+01	2.00E+00	ND					ND					ND				
Sodium	mg/kg	6.34E+02	NA	NA	ND					2.38E+01	J				ND				
Vanadium	mg/kg	5.88E+01	5.31E+01	2.00E+00	1.57E+01				YES	1.64E+01				YES	1.54E+01				YES
Zinc	mg/kg	4.06E+01	2.34E+03	5.00E+01	5.71E+01	J	YES		YES	1.27E+01	J				1.01E+01	J			
VOLATILE ORGANIC COMPOUNDS																			
2-Butanone	mg/kg	NA	4.66E+03	8.96E+01	9.30E-03	J				5.30E-03	J				6.80E-03	J			
2-Hexanone	mg/kg	NA	3.11E+02	1.26E+01	ND					ND					ND				
Acetone	mg/kg	NA	7.76E+02	2.50E+00	1.30E-01	J				1.60E-01	J				1.10E-01	J			
Chloroform	mg/kg	NA	1.03E+02	1.00E-03	ND					5.20E-03	J			YES	ND				
Methylene chloride	mg/kg	NA	8.41E+01	2.00E+00	2.80E-03	B				2.80E-03	B				2.40E-03	B			
Tetrachloroethene	mg/kg	NA	1.21E+01	1.00E-02	6.60E-03					ND					ND				
Toluene	mg/kg	NA	1.55E+03	5.00E-02	ND					1.70E-02					2.40E-03	J			
Trichlorofluoromethane	mg/kg	NA	2.33E+03	1.00E-01	ND					ND					1.30E-03	J			
p-Cymene	mg/kg	NA	1.55E+03	NA	ND					3.30E-02					8.60E-03				
sec-Butylbenzene	mg/kg	NA	7.77E+01	NA	ND					4.60E-03	J				1.40E-03	J			
SEMI-VOLATILE ORGANIC COMPOUNDS																			
Bis(2-Ethylhexyl)phthalate	mg/kg	NA	4.52E+01	9.30E-01	ND					ND					ND				

Table 5-1

**Surface and Depositional Soil Analytical Results
Training Area T-31, Parcels 184(7) and 185(7)
Fort McClellan, Calhoun County, Alabama**

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Analyses performed using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods.

^a BKG - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in SAIC, 1998, *Final Background Metals Survey Report, Fort McClellan, Alabama*, July.

^b Residential human health site-specific screening level (SSSL) and ecological screening value (ESV) as given in IT Corporation, 2000, *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama* July.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit.

J - Compound was positively identified; reported value is an estimated concentration.

mg/kg - Milligrams per kilogram.

NA - Not available.

ND - Not detected.

Qual - Data validation qualifier.

Table 5-2

Subsurface Soil Analytical Results
Training Area T-31, Parcels 184(7) and 185(7)
Fort McClellan, Calhoun County, Alabama

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Sample Location Sample Number Sample Date Sample Depth (feet)				CWM-184-MW01 TL0002 16-Oct-01 4 - 5				CWM-184-MW02 TL0004 16-Oct-01 5 - 6				CWM-184-MW03 TL0006 16-Oct-01 5 - 6				CWM-184-MW04 TL0008 16-Oct-01 2 - 3			
Parameter	Units	BKG ^a	SSSL ^b	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
METALS																			
Aluminum	mg/kg	1.36E+04	7.80E+03	1.40E+04		YES	YES	1.43E+04		YES	YES	2.43E+04		YES	YES	1.25E+04			YES
Antimony	mg/kg	1.31E+00	3.11E+00	ND				ND				5.62E+00	J	YES	YES	ND			
Arsenic	mg/kg	1.83E+01	4.26E-01	2.91E+00			YES	1.84E+00			YES	7.28E+00			YES	2.86E+00			YES
Barium	mg/kg	2.34E+02	5.47E+02	4.20E+01				3.31E+01				5.59E+01				3.08E+01			
Beryllium	mg/kg	8.60E-01	9.60E+00	ND				ND				4.31E-01	J			ND			
Calcium	mg/kg	6.37E+02	NA	6.65E+01	B			6.43E+01	B			3.56E+02				2.11E+02			
Chromium	mg/kg	3.83E+01	2.32E+01	1.36E+01				1.35E+01				2.06E+01				1.34E+01			
Cobalt	mg/kg	1.75E+01	4.68E+02	4.03E+00				2.31E+00				4.36E+00				1.55E+00	J		
Copper	mg/kg	1.94E+01	3.13E+02	3.75E+00				3.96E+00				5.74E+00				5.77E+00			
Iron	mg/kg	4.48E+04	2.34E+03	1.61E+04			YES	9.03E+03			YES	3.44E+04			YES	1.05E+04			YES
Lead	mg/kg	3.85E+01	4.00E+02	7.09E+00				5.95E+00				1.09E+01				6.61E+00			
Magnesium	mg/kg	7.66E+02	NA	6.94E+02				6.17E+02				9.98E+02		YES		5.85E+02			
Manganese	mg/kg	1.36E+03	3.63E+02	2.39E+01				9.71E+00				3.30E+01				9.58E+00			
Mercury	mg/kg	7.00E-02	2.33E+00	ND				ND				3.60E-02	J			ND			
Nickel	mg/kg	1.29E+01	1.54E+02	5.39E+00				4.95E+00				8.53E+00				4.33E+00			
Potassium	mg/kg	7.11E+02	NA	7.96E+02	B	YES		6.88E+02	B			1.18E+03		YES		6.56E+02			
Sodium	mg/kg	7.02E+02	NA	ND				ND				ND				2.27E+01	J		
Vanadium	mg/kg	6.49E+01	5.31E+01	2.23E+01				2.25E+01				4.28E+01				2.64E+01			
Zinc	mg/kg	3.49E+01	2.34E+03	1.56E+01				1.23E+01				2.34E+01				1.09E+01			
VOLATILE ORGANIC COMPOUNDS																			
2-Butanone	mg/kg	NA	4.66E+03	3.60E-03	J			ND				ND				ND			
4-Methyl-2-pentanone	mg/kg	NA	6.21E+02	9.20E-03	J			ND				ND				ND			
Acetone	mg/kg	NA	7.76E+02	9.20E-02	J			1.50E-02	J			1.30E-02	J			1.20E-02	J		
Methylene chloride	mg/kg	NA	8.41E+01	1.60E-03	B			1.60E-03	B			2.00E-03	B			1.50E-03	B		
Toluene	mg/kg	NA	1.55E+03	ND				ND				1.10E-03	J			ND			
Trichlorofluoromethane	mg/kg	NA	2.33E+03	ND				1.10E-03	J			ND				ND			
p-Cymene	mg/kg	NA	1.55E+03	1.20E-03	J			ND				ND				ND			

Table 5-2

**Subsurface Soil Analytical Results
Training Area T-31, Parcels 184(7) and 185(7)
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 3)

Sample Location Sample Number Sample Date Sample Depth (feet)				CWM-184-MW05 TL0010 16-Oct-01 7 - 8				CWM-185-GP01 TF0008 16-Oct-01 7 - 8				CWM-185-MW01 TF0002 16-Oct-01 4 - 5				CWM-185-MW02 TF0004 16-Oct-01 2 - 3			
Parameter	Units	BKG ^a	SSSL ^a	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
METALS																			
Aluminum	mg/kg	1.36E+04	7.80E+03	1.49E+04		YES	YES	1.18E+04			YES	1.53E+04		YES	YES	6.45E+03			
Antimony	mg/kg	1.31E+00	3.11E+00	ND				ND				ND				ND			
Arsenic	mg/kg	1.83E+01	4.26E-01	2.48E+00			YES	2.10E+00			YES	1.17E+00			YES	1.39E+00			YES
Barium	mg/kg	2.34E+02	5.47E+02	4.19E+01				5.81E+01				7.45E+01				4.65E+01			
Beryllium	mg/kg	8.60E-01	9.60E+00	ND				4.18E-01	J			4.37E-01	J			ND			
Calcium	mg/kg	6.37E+02	NA	3.77E+01	B			1.98E+02	J			2.21E+02	J			1.26E+02	J		
Chromium	mg/kg	3.83E+01	2.32E+01	1.22E+01				1.06E+01				1.36E+01				6.43E+00			
Cobalt	mg/kg	1.75E+01	4.68E+02	6.04E+00				4.33E+00				2.68E+00				1.82E+00	J		
Copper	mg/kg	1.94E+01	3.13E+02	5.11E+00				2.11E+00	J			2.18E+00	J			8.89E-01	J		
Iron	mg/kg	4.48E+04	2.34E+03	1.41E+04		YES		1.03E+04			YES	6.86E+03			YES	4.77E+03			YES
Lead	mg/kg	3.85E+01	4.00E+02	8.34E+00				8.50E+00				8.04E+00				5.61E+00			
Magnesium	mg/kg	7.66E+02	NA	7.35E+02				7.09E+02				9.44E+02		YES		3.61E+02			
Manganese	mg/kg	1.36E+03	3.63E+02	2.65E+01				7.14E+01				2.73E+01				1.19E+02			
Mercury	mg/kg	7.00E-02	2.33E+00	ND				ND				ND				ND			
Nickel	mg/kg	1.29E+01	1.54E+02	5.85E+00				4.29E+00				6.27E+00				2.91E+00			
Potassium	mg/kg	7.11E+02	NA	9.50E+02		YES		7.79E+02		YES		1.01E+03		YES		3.85E+02	B		
Sodium	mg/kg	7.02E+02	NA	ND				ND				2.35E+01	J			ND			
Vanadium	mg/kg	6.49E+01	5.31E+01	2.24E+01				1.90E+01				1.88E+01				1.03E+01			
Zinc	mg/kg	3.49E+01	2.34E+03	1.65E+01				2.19E+01	J			1.32E+01	J			6.54E+00	J		
VOLATILE ORGANIC COMPOUNDS																			
2-Butanone	mg/kg	NA	4.66E+03	ND				ND				ND				6.40E-03	J		
4-Methyl-2-pentanone	mg/kg	NA	6.21E+02	ND				ND				9.70E-03	J			ND			
Acetone	mg/kg	NA	7.76E+02	6.30E-03	J			1.10E-02	J			8.10E-03	J			7.60E-02	J		
Methylene chloride	mg/kg	NA	8.41E+01	1.60E-03	B			1.80E-03	B			3.10E-03	B			2.50E-03	B		
Toluene	mg/kg	NA	1.55E+03	ND				ND				ND				ND			
Trichlorofluoromethane	mg/kg	NA	2.33E+03	2.40E-03	J			ND				ND				ND			
p-Cymene	mg/kg	NA	1.55E+03	ND				ND				ND				ND			

Table 5-2

**Subsurface Soil Analytical Results
Training Area T-31, Parcels 184(7) and 185(7)
Fort McClellan, Calhoun County, Alabama**

(Page 3 of 3)

Analyses performed using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods.

^a BKG - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in SAIC, 1998, *Final Background Metals Survey Report, Fort McClellan, Alabama*, July.

^b Residential human health site-specific screening level (SSSL) as given in IT Corporation, 2000, *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama*, July.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit.

J - Compound was positively identified; reported value is an estimated concentration.

mg/kg - Milligrams per kilogram.

NA - Not available.

ND - Not detected.

Qual - Data validation qualifier.

Table 5-3

Groundwater Analytical Results
Training Area T-31, Parcels 184(7) and 185(7)
Fort McClellan, Calhoun County, Alabama

(Page 1 of 4)

Sample Location Sample Number Sample Date				CWM-184-MW01 TL3001 6-Dec-01				CWM-184-MW01 TL3006 8-Jan-03				CWM-184-MW02 TL3002 7-Dec-01				CWM-184-MW02 TL3007 10-Jan-03			
Parameter	Units	BKG ^a	SSSL ^b	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
METALS																			
Aluminum	mg/L	2.34E+00	1.56E+00	ND				NR				ND				NR			
Arsenic	mg/L	1.78E-02	4.46E-05	3.72E-03	B		YES	NR				ND				NR			
Barium	mg/L	1.27E-01	1.10E-01	9.57E-03	J			NR				2.62E-02				NR			
Calcium	mg/L	5.65E+01	NA	1.84E+00				NR				7.06E+00				NR			
Cobalt	mg/L	2.34E-02	9.39E-02	1.15E-02	J			NR				ND				NR			
Iron	mg/L	7.04E+00	4.69E-01	1.22E-02	B			NR				1.05E-01	J			NR			
Lead	mg/L	8.00E-03	1.50E-02	ND				NR				ND				NR			
Magnesium	mg/L	2.13E+01	NA	8.89E-01	J			NR				3.80E+00				NR			
Manganese	mg/L	5.81E-01	7.35E-02	6.17E-01		YES	YES	NR				1.29E+00		YES	YES	NR			
Potassium	mg/L	7.20E+00	NA	ND				NR				1.09E+00	J			NR			
Selenium	mg/L	NA	7.82E-03	ND				NR				ND				NR			
Sodium	mg/L	1.48E+01	NA	8.83E-01	J			NR				4.93E+00				NR			
Vanadium	mg/L	1.70E-02	1.10E-02	ND				NR				ND				NR			
VOLATILE ORGANIC COMPOUNDS																			
Acetone	mg/L	NA	1.56E-01	4.30E-01	J		YES	ND				1.30E+00	J		YES	ND			
Bromodichloromethane	mg/L	NA	1.08E-03	ND				ND				ND				ND			
Chloroform	mg/L	NA	1.15E-03	ND				ND				7.80E-04	J			ND			
Methylene chloride	mg/L	NA	7.85E-03	ND				4.20E-04	B			ND				5.80E-04	B		
Toluene	mg/L	NA	2.59E-01	ND				ND				ND				2.20E-04	J		
Trichloroethene	mg/L	NA	4.51E-03	ND				ND				3.30E-04	J			ND			

Table 5-3

Groundwater Analytical Results
Training Area T-31, Parcels 184(7) and 185(7)
Fort McClellan, Calhoun County, Alabama

(Page 2 of 4)

Sample Location Sample Number Sample Date				CWM-184-MW03 TL3003 11-Dec-01				CWM-184-MW03 TL3008 8-Jan-03				CWM-184-MW04 TL3004 13-Dec-01				CWM-184-MW04 TL3009 14-Jan-03			
Parameter	Units	BKG ^a	SSSL ^b	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
METALS																			
Aluminum	mg/L	2.34E+00	1.56E+00	ND				NR				3.64E+00		YES	YES	NR			
Arsenic	mg/L	1.78E-02	4.46E-05	ND				NR				3.52E-03	B		YES	NR			
Barium	mg/L	1.27E-01	1.10E-01	5.34E-03	J			NR				2.43E-02				NR			
Calcium	mg/L	5.65E+01	NA	2.47E+01				NR				2.22E+01				NR			
Cobalt	mg/L	2.34E-02	9.39E-02	ND				NR				ND				NR			
Iron	mg/L	7.04E+00	4.69E-01	3.25E-02	B			NR				3.24E+00			YES	NR			
Lead	mg/L	8.00E-03	1.50E-02	ND				NR				1.90E-03	J			NR			
Magnesium	mg/L	2.13E+01	NA	1.43E+01				NR				1.49E+01				NR			
Manganese	mg/L	5.81E-01	7.35E-02	3.86E-02	J			NR				1.92E-01			YES	NR			
Potassium	mg/L	7.20E+00	NA	9.93E-01	J			NR				1.16E+00	J			NR			
Selenium	mg/L	NA	7.82E-03	4.35E-03	B			NR				ND				NR			
Sodium	mg/L	1.48E+01	NA	1.46E+00	B			NR				1.26E+00	B			NR			
Vanadium	mg/L	1.70E-02	1.10E-02	ND				NR				6.27E-03	B			NR			
VOLATILE ORGANIC COMPOUNDS																			
Acetone	mg/L	NA	1.56E-01	ND				ND				ND				9.50E-03	B		
Bromodichloromethane	mg/L	NA	1.08E-03	ND				ND				2.20E-04	J			ND			
Chloroform	mg/L	NA	1.15E-03	4.30E-04	B			3.30E-04	J			4.90E-04	B			ND			
Methylene chloride	mg/L	NA	7.85E-03	2.10E-04	B			4.30E-04	B			ND				4.70E-04	B		
Toluene	mg/L	NA	2.59E-01	ND				ND				ND				ND			
Trichloroethene	mg/L	NA	4.51E-03	4.80E-03			YES	4.30E-03				6.90E-04	J			4.30E-04	J		

Table 5-3

Groundwater Analytical Results
Training Area T-31, Parcels 184(7) and 185(7)
Fort McClellan, Calhoun County, Alabama

(Page 3 of 4)

Sample Location Sample Number Sample Date				CWM-184-MW05 TL3005 5-Dec-01				CWM-184-MW05 TL3010 10-Jan-03				CWM-185-MW01 TF3001 4-Dec-01			
Parameter	Units	BKG ^a	SSSL ^b	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
METALS															
Aluminum	mg/L	2.34E+00	1.56E+00	1.41E-01	J			NR				2.31E-01	J		
Arsenic	mg/L	1.78E-02	4.46E-05	2.15E-03	B		YES	NR				2.74E-03	B		YES
Barium	mg/L	1.27E-01	1.10E-01	1.93E-02				NR				1.54E-02			
Calcium	mg/L	5.65E+01	NA	2.47E+01				NR				2.50E+01			
Cobalt	mg/L	2.34E-02	9.39E-02	ND				NR				ND			
Iron	mg/L	7.04E+00	4.69E-01	1.68E-01	J			NR				3.30E-01	J		
Lead	mg/L	8.00E-03	1.50E-02	3.37E-03	B			NR				ND			
Magnesium	mg/L	2.13E+01	NA	1.53E+01				NR				1.55E+01			
Manganese	mg/L	5.81E-01	7.35E-02	6.54E-02	J			NR				1.66E-01			YES
Potassium	mg/L	7.20E+00	NA	ND				NR				9.96E-01	J		
Selenium	mg/L	NA	7.82E-03	ND				NR				3.57E-03	B		
Sodium	mg/L	1.48E+01	NA	1.26E+00				NR				1.09E+00			
Vanadium	mg/L	1.70E-02	1.10E-02	ND				NR				ND			
VOLATILE ORGANIC COMPOUNDS															
Acetone	mg/L	NA	1.56E-01	ND				1.10E-01	J			ND			
Bromodichloromethane	mg/L	NA	1.08E-03	ND				ND				ND			
Chloroform	mg/L	NA	1.15E-03	2.90E-04	B			ND				ND			
Methylene chloride	mg/L	NA	7.85E-03	6.30E-04	B			5.40E-04	B			ND			
Toluene	mg/L	NA	2.59E-01	ND				2.60E-04	J			ND			
Trichloroethene	mg/L	NA	4.51E-03	ND				ND				ND			

Table 5-3

Groundwater Analytical Results
Training Area T-31, Parcels 184(7) and 185(7)
Fort McClellan, Calhoun County, Alabama

(Page 4 of 4)

Sample Location Sample Number Sample Date				CWM-185-MW01 TF3004 9-Jan-03				CWM-185-MW02 TF3002 4-Dec-01				CWM-185-MW02 TF3005 9-Jan-03			
Parameter	Units	BKG ^a	SSSL ^b	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL	Result	Qual	>BKG	>SSSL
METALS															
Aluminum	mg/L	2.34E+00	1.56E+00	NR				ND				NR			
Arsenic	mg/L	1.78E-02	4.46E-05	NR				ND				NR			
Barium	mg/L	1.27E-01	1.10E-01	NR				2.82E-02				NR			
Calcium	mg/L	5.65E+01	NA	NR				2.32E+01				NR			
Cobalt	mg/L	2.34E-02	9.39E-02	NR				ND				NR			
Iron	mg/L	7.04E+00	4.69E-01	NR				7.01E-02	J			NR			
Lead	mg/L	8.00E-03	1.50E-02	NR				ND				NR			
Magnesium	mg/L	2.13E+01	NA	NR				1.45E+01				NR			
Manganese	mg/L	5.81E-01	7.35E-02	NR				6.62E-01		YES	YES	NR			
Potassium	mg/L	7.20E+00	NA	NR				1.05E+00	J			NR			
Selenium	mg/L	NA	7.82E-03	NR				2.72E-03	B			NR			
Sodium	mg/L	1.48E+01	NA	NR				2.42E+01		YES		NR			
Vanadium	mg/L	1.70E-02	1.10E-02	NR				ND				NR			
VOLATILE ORGANIC COMPOUNDS															
Acetone	mg/L	NA	1.56E-01	ND				5.30E+00	J		YES	ND			
Bromodichloromethane	mg/L	NA	1.08E-03	ND				ND				ND			
Chloroform	mg/L	NA	1.15E-03	ND				1.20E-03	B		YES	ND			
Methylene chloride	mg/L	NA	7.85E-03	5.50E-04	B			ND				4.80E-04	B		
Toluene	mg/L	NA	2.59E-01	ND				ND				ND			
Trichloroethene	mg/L	NA	4.51E-03	ND				ND				ND			

Analyses performed using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods.

^a BKG - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in SAIC, 1998, *Final Background Metals Survey Report, Fort McClellan, Alabama*, July.

^b Residential human health site-specific screening level (SSSL) as given in IT, 2000, *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama*, July.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit.

J - Compound was positively identified; reported value is an estimated concentration.

mg/L - Milligrams per liter.

NA - Not available.

ND - Not detected.

NR - Not requested.

Qual - Data validation qualifier.

Table 5-4

Surface Water Analytical Results
Training Area T-31, Parcels 184(7) and 185(7)
Fort McClellan, Calhoun County, Alabama

Sample Location Sample Number Sample Date					CWM-185-SW/SD02 TF2002 9-Nov-01				
Parameter	Units	BKG ^a	SSSL ^b	ESV ^b	Result	Qual	>BKG	>SSSL	>ESV
METALS									
Aluminum	mg/L	5.26E+00	1.53E+01	8.70E-02	1.82E-01	B			YES
Barium	mg/L	7.54E-02	1.10E+00	3.90E-03	1.54E-02				YES
Calcium	mg/L	2.52E+01	NA	1.16E+02	2.32E+01				
Iron	mg/L	1.96E+01	4.70E+00	1.00E+00	4.40E-01	J			
Magnesium	mg/L	1.10E+01	NA	8.20E+01	1.38E+01		YES		
Manganese	mg/L	5.65E-01	6.40E-01	8.00E-02	4.14E-02	J			
Potassium	mg/L	2.56E+00	NA	5.30E+01	9.64E-01	J			
Selenium	mg/L	NA	7.82E-02	5.00E-03	3.20E-03	J			
Sodium	mg/L	3.44E+00	NA	6.80E+02	8.89E-01	J			
Thallium	mg/L	2.49E-03	1.02E-03	4.00E-03	4.35E-02		YES	YES	YES

Analyses performed using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods.

^a BKG - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in SAIC, 1998, *Final Background Metals Survey Report, Fort McClellan, Alabama*, July.

^b Recreational site user human health site-specific screening level (SSSL) and ecological screening value (ESV) as given in IT Corporation, 2000, *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama*, July.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit.

J - Compound was positively identified; reported value is an estimated concentration.

mg/L - Milligrams per liter.

NA - Not available.

Qual - Data validation qualifier.

Table 5-5

Sediment Analytical Results
Training Area T-31, Parcels 184(7) and 185(7)
Fort McClellan, Calhoun County, Alabama

Sample Location Sample Number Sample Date Sample Depth (Feet)					CWM-185-SW/SD02 TF1002 9-Nov-01 0 - 0.5				
Parameter	Units	BKG ^a	SSSL ^b	ESV ^b	Result	Qual	>BKG	>SSSL	>ESV
METALS									
Aluminum	mg/kg	8.59E+03	1.15E+06	NA	2.88E+03	J			
Arsenic	mg/kg	1.13E+01	5.58E+01	7.24E+00	1.54E+00				
Barium	mg/kg	9.89E+01	8.36E+04	NA	1.30E+01				
Calcium	mg/kg	1.11E+03	NA	NA	1.87E+02	J			
Chromium	mg/kg	3.12E+01	2.79E+03	5.23E+01	6.48E+00				
Copper	mg/kg	1.71E+01	4.74E+04	1.87E+01	1.93E+00	J			
Iron	mg/kg	3.53E+04	3.59E+05	NA	5.99E+03				
Lead	mg/kg	3.78E+01	4.00E+02	3.02E+01	3.29E+00				
Magnesium	mg/kg	9.06E+02	NA	NA	2.47E+02				
Manganese	mg/kg	7.12E+02	4.38E+04	NA	2.06E+01				
Nickel	mg/kg	1.30E+01	1.76E+04	1.59E+01	1.25E+00	J			
Potassium	mg/kg	1.01E+03	NA	NA	2.98E+02	J			
Vanadium	mg/kg	4.09E+01	4.83E+03	NA	7.74E+00				
Zinc	mg/kg	5.27E+01	3.44E+05	1.24E+02	6.29E+00	J			
TOTAL ORGANIC CARBON									
Total Organic Carbon	mg/kg	NA	NA	NA	3.91E+01	J			
VOLATILE ORGANIC COMPOUNDS									
Acetone	mg/kg	NA	1.03E+05	4.53E-01	3.60E-02	J			

Analyses performed using U.S. Environmental Protection Agency (EPA) SW-846 analytical methods.

^a BKG - Background. Concentration listed is two times (2x) the arithmetic mean of background metals concentration given in SAIC, 1998, *Final Background Metals Survey Report, Fort McClellan, Alabama, July*.

^b Recreational site user human health site-specific screening level (SSSL) and ecological screening value (ESV) as given in IT Corporation, 2000, *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, July*.

B - Analyte detected in laboratory or field blank at concentration greater than the reporting limit.

J - Compound was positively identified; reported value is an estimated concentration.

mg/kg - Milligrams per kilogram.

NA - Not available.

Qual - Data validation qualifier.

- 1
- 2
- 3
- 4
- 5
- Antimony (4.62 mg/kg) exceeded its SSSL (3.11 mg/kg) and background (1.99 mg/kg) at sample location CWM-184-MW01. The result was flagged with a "J" data qualifier, indicating that it was estimated.

6 Fourteen metals were detected at concentrations exceeding ESVs: aluminum, antimony, barium,
7 beryllium, chromium, copper, iron, lead, manganese, mercury, selenium, silver, vanadium, and
8 zinc. Of these, the following ten metals also exceeded their respective background values in one
9 or more samples:

- 10
- 11
- 12
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- 43
- Aluminum (20,200 mg/kg) exceeded its ESV (50 mg/kg) and background (16,306 mg/kg) at sample location CWM-185-DEP02.
 - Antimony (4.62 mg/kg) exceeded its ESV (3.50 mg/kg) and background (1.99 mg/kg) at sample location CWM-184-MW01. The result was flagged with a "J" data qualifier, indicating that it was estimated.
 - Barium (171 mg/kg) exceeded its ESV (165 mg/kg) and background (124 mg/kg) at sample location CWM-184-DEP01.
 - Beryllium (1.1 mg/kg) equaled its ESV (1.1 mg/kg) and exceeded background (0.8 mg/kg) at sample location CWM-184-DEP01. The result was "J" flagged.
 - Copper (111 mg/kg) exceeded its ESV (40.0 mg/kg) and background (12.7 mg/kg) at sample location CWM-184-DEP01.
 - Lead (65.9 to 193 mg/kg) exceeded its ESV (50.0 mg/kg) and background (40.1 mg/kg) at three sample locations: CWM-184-DEP01, CWM-185-DEP01, and CWM-185-DEP02.
 - Mercury (0.40 mg/kg) exceeded its ESV (0.10 mg/kg) and background (0.08 mg/kg) at sample location CWM-184-DEP01.
 - Selenium (0.81 mg/kg) equaled its ESV (0.81 mg/kg) and exceeded background (0.48 mg/kg) at sample location CWM-184-DEP01. The result was "J" flagged.
 - Silver (17.1 mg/kg) exceeded its ESV (2 mg/kg) and background (0.36 mg/kg) at sample location CWM-184-DEP01.
 - Zinc (55.1 and 57.1 mg/kg) exceeded its ESV (50.0 mg/kg) and background (40.6 mg/kg) at two sample locations, CWM-184-DEP01 and CWM-185-GP01. One of the results was "J" flagged.

1 Volatile Organic Compounds. A total of ten VOCs (2-butanone, 2-hexanone, acetone,
2 chloroform, methylene chloride, p-cymene, sec-butylbenzene, tetrachloroethene, toluene, and
3 trichlorofluoromethane) were detected in the surface and depositional soil samples. The VOC
4 results were all below SSSLs. Chloroform concentrations (0.0023 and 0.0052 mg/kg) exceeded
5 its ESV (0.001 mg/kg) at two sample locations, CWM-184-MW03 and CWM-185-MW01. Both
6 results were flagged with a "J" data qualifier, indicating that the results were estimated.

8 Semivolatile Organic Compounds. One SVOC (bis[2-ethylhexyl]phthalate) was detected
9 in one depositional soil sample at an estimated concentration below its SSSL and ESV.

11 CWM Breakdown Products. CWM breakdown products were not detected in the surface
12 and depositional soil samples.

14 5.2 Subsurface Soil Analytical Results

15 Eight subsurface soil samples were collected for chemical analysis at Training Area T-31,
16 Parcels 184(7) and 185(7). Subsurface soil samples were collected at depths greater than one
17 foot bgs at the locations shown on Figure 3-1. Analytical results were compared to residential
18 human health SSSLs and metals background screening values, as presented in Table 5-2.

20 Metals. A total of 19 metals were detected in the subsurface soil samples. The concentrations
21 of four metals (aluminum, antimony, arsenic, and iron) exceeded SSSLs. Of these, aluminum
22 and antimony results also exceeded their respective background values:

- 24 • Aluminum (14,00 to 24,300 mg/kg) exceeded its SSSL (7,803 mg/kg) and
25 background (13,591 mg/kg) at 5 sample locations (CWM-184-MW01, CWM-184-
26 MW02, CWM-184-MW03, CWM-184-MW05, and CWM-185-MW01).
- 28 • Antimony (5.62 mg/kg) exceeded its SSSL (3.11 mg/kg) and background (1.31
29 mg/kg) at sample location CWM-184-MW03. The result was flagged with a "J"
30 data qualifier, indicating that it was estimated.

32 Volatile Organic Compounds. A total of seven VOCs (2-butanone, 4-methyl-2-pentanone,
33 acetone, methylene chloride, p-cymene, toluene, and trichlorofluoromethane) were detected in
34 the subsurface soil samples at concentrations below their respective SSSLs. The methylene
35 chloride results were flagged with a "B" data qualifier, signifying that the compound was also
36 detected in an associated laboratory or field blank sample. The remaining VOC results were
37 flagged with a "J" data qualifier, signifying that the results were estimated.

1 **Semivolatile Organic Compounds.** SVOCs were not detected in the subsurface soil
2 samples.

4 **CWM Breakdown Products.** CWM breakdown products were not detected in the subsurface
5 soil samples.

7 **5.3 Groundwater Analytical Results**

8 Fourteen groundwater samples were collected for chemical analysis at Training Area T-31,
9 Parcels 184(7) and 185(7), at the seven well locations shown on Figure 3-1. Two rounds of
10 sampling were conducted. The second round of sampling (Phase II) was performed to confirm
11 the presence of VOCs detected in the initial samples. Analytical results were compared to
12 residential human health SSSLs and metals background screening values, as presented in Table
13 5-3.

15 **Metals.** The seven Phase I groundwater samples were analyzed for metals. A total of thirteen
16 metals were detected in the samples. The concentrations of four metals (aluminum, arsenic, iron,
17 and manganese) exceeded their respective SSSLs. The concentrations of aluminum and
18 manganese also exceeded their respective background concentrations:

- 20 • Aluminum (3.64 mg/L) exceeded its SSSL (1.56 mg/L) and background
21 concentration (2.34 mg/L) at sample location CWM-184-MW04.
- 23 • Manganese (0.617 to 1.29 mg/L) exceeded its SSSL (0.074 mg/L) and background
24 concentration (0.581 mg/L) at three sample locations: CWM-184-MW01, CWM-
25 184-MW02, and CWM-185-MW02.

27 **Volatile Organic Compounds.** All of the groundwater samples were analyzed for VOCs. A
28 total of six VOCs (acetone, bromodichloromethane, chloroform, methylene chloride, toluene,
29 and trichloroethene) were detected in the samples. The following three VOCs exceeded their
30 respective SSSLs in the initial round of sampling only:

- 32 • Acetone (0.43 to 5.3 mg/L) exceeded its SSSL (0.16 mg/L) at CWM-184-MW01,
33 CWM-184-MW02, and CWM-185-MW02. All results were flagged with a "J"
34 data qualifier, signifying that the results were estimated.
- 36 • Chloroform (0.0012 mg/L) exceeded its SSSL (0.0015 mg/L) at sample location
37 CWM-185-MW02. The result was flagged with a "B" data qualifier, indicating

1 that the compound was also detected in an associated laboratory or field blank
2 sample.

- 3
4 • Trichloroethene (0.0048 mg/L) exceeded its SSSL (0.0045 mg/L) at sample
5 location CWM-184-MW03.
6

7 Acetone and chloroform were not detected in these wells during the second round of sampling
8 and all Phase II VOC results were below SSSLs. Trichloroethene was detected during Phase II
9 sampling but at concentrations below its SSSL.
10

11 **Semivolatile Organic Compounds.** The seven Phase I groundwater samples were analyzed
12 for SVOCs. SVOCs were not detected in the samples.
13

14 **CWM Breakdown Products.** The seven Phase I groundwater samples were analyzed for
15 CWM breakdown products. CWM breakdown products were not detected in the samples.
16

17 **5.4 Surface Water Analytical Results**

18 One surface water sample was collected for chemical analysis at Training Area T-31, Parcels
19 184(7) and 185(7), at the location shown on Figure 3-1. Analytical results were compared to
20 recreational site user human health SSSLs, ESVs, and metals background concentrations, as
21 presented in Table 5-4. It should be noted that the assumptions for residential and recreational
22 site user exposure to surface water are identical.
23

24 **Metals.** A total of ten metals were detected in the surface water sample at concentrations below
25 SSSLs, with the exception of thallium. The concentrations of aluminum, barium, and thallium
26 exceeded their respective ESVs but the concentrations of aluminum and barium were below
27 background values. The concentration of thallium (0.044 mg/L) exceeded its SSSL (0.001
28 mg/L), ESV (0.004 mg/L), and background concentration (0.002 mg/L) at sample location
29 CWM-185-SW/SD02.
30

31 **Volatile Organic Compounds.** VOCs were not detected in the surface water sample.
32

33 **Semivolatile Organic Compounds.** SVOCs were not detected in the surface water sample.
34

35 **CWM Breakdown Products.** CWM breakdown products were not detected in the surface
36 water sample.

5.5 Sediment Analytical Results

One sediment sample was collected for chemical and physical analyses at Training Area T-31, Parcels 184(7) and 185(7), at the location shown on Figure 3-1. Analytical results were compared to recreational site user human health SSSLs, ESVs, and metals background concentrations, as presented in Table 5-5. It should be noted that the assumptions for residential and recreational user exposure to sediment are identical.

Metals. A total of fourteen metals were detected in the sediment sample at concentrations below their respective SSSLs and ESVs.

Volatile Organic Compounds. One VOC (acetone) was detected in the sediment sample at an estimated concentration below its SSSL and ESV.

Semivolatile Organic Compounds. SVOCs were not detected in the sediment sample.

CWM Breakdown Products. CWM breakdown products were not detected in the sediment sample.

Total Organic Carbon. The sediment sample was analyzed for TOC. The TOC concentration in the sample was 39.1 mg/kg, as summarized in Appendix F.

Grain Size. The grain size results for the sediment sample are included in Appendix F.

5.6 Statistical and Geochemical Evaluations of Site Metals Data

Site metals data were further evaluated using statistical and geochemical methods to determine if the metals detected in site media are site related. This multi-tiered approach is described in the Shaw technical memorandum "Selecting Site-Related Chemicals for Human Health and Ecological Risk Assessments for FTMC: Revision 2" (Shaw, 2003). The statistical and geochemical evaluations determined that the metals detected in site media were all naturally occurring, except for mercury and silver in one depositional soil sample (Appendix H). The geochemical evaluation concluded that the mercury and silver concentrations at sample location CWM-184-DEP01 are anomalously high and may contain a component of contamination.

6.0 Summary, Conclusions, and Recommendations

Shaw completed an SI at Training Area T-31, Parcels 184(7) and 185(7), at FTMC in Calhoun County, Alabama. The SI was conducted to determine whether chemical constituents are present at the site at concentrations that present an unacceptable risk to human health or the environment. Phase I of the SI consisted of the collection and analysis of eleven surface and depositional soil samples, eight subsurface soil samples, seven groundwater samples, one surface water sample, and one sediment sample. In addition, seven permanent monitoring wells were installed in the saturated zone to facilitate groundwater sample collection and to provide site-specific geological and hydrogeological characterization information. Phase II of the SI consisted of a second round of groundwater sampling for VOC analysis only.

Chemical analysis of samples collected at the site indicates that metals, VOCs, and SVOCs were detected in the various site media. CWM breakdown products were not detected in site media. Analytical results were compared to the SSSLs and ESVs for FTMC. The SSSLs and ESVs were developed by Shaw for human health and ecological risk evaluations as part of the ongoing SIs being performed under the BRAC Environmental Restoration Program at FTMC. Metals concentrations exceeding SSSLs and ESVs were compared to medium-specific background screening values (SAIC, 1998). In addition, site metals data were further evaluated using statistical and geochemical methods to select site-related metals.

Aluminum and antimony in soil, aluminum and manganese in groundwater, and thallium in surface water were detected at concentrations exceeding SSSLs and background and, thus, were selected as chemicals of potential concern in site media. No chemicals of potential concern were identified for sediment. The statistical and geochemical evaluations, however, determined that these metals were present at naturally occurring levels. Three VOCs (acetone, chloroform, and trichloroethene) were also identified as chemicals of potential concern in groundwater because their concentrations exceeded SSSLs during the initial round of sampling. However, during the second round of sampling, these chemicals were either not detected or their concentrations were below SSSLs. Therefore, it is concluded that these VOCs do not pose a threat to human health.

Ten metals in surface and depositional soil (aluminum, antimony, barium, beryllium, copper, lead, mercury, selenium, silver, and zinc) and thallium in surface water were detected at concentrations exceeding ESVs and background, and thus were selected as constituents of potential ecological concern in site media. In addition, the VOC chloroform was selected as a

1 constituent of potential ecological concern in surface soil because it was detected at low
2 estimated concentrations (0.0023 and 0.0052 mg/kg) exceeding its ESV (0.001 mg/kg) in two
3 samples. No constituents of potential ecological concern were identified for sediment. The
4 statistical and geochemical evaluations determined that metals detected in site media were
5 present at naturally occurring levels except for mercury and silver in one depositional soil sample
6 (CWM-184-DEP01). Although silver (17.1 mg/kg) exceeded its ESV (2 mg/kg) and background
7 (0.36 mg/kg) in one sample, it was not detected in any other site samples. Mercury was detected
8 in five of 19 soil samples (including subsurface soil) and only one result (0.4 mg/kg) exceeded
9 its ESV (0.1 mg/kg). The remaining mercury results were below the ESV and background.
10 Based on the relatively low detected levels above screening values and/or infrequent detection in
11 site media, it is concluded that the constituents of potential ecological concern do not pose an
12 unacceptable threat to ecological receptors.

13
14 Based on the results of the SI, past operations at Training Area T-31, Parcels 184(7) and 185(7),
15 have not adversely impacted the environment. The metals and chemical compounds detected in
16 site media do not pose an unacceptable risk to human health and the environment. Therefore,
17 Shaw recommends "No Further Action" and unrestricted land reuse for Parcel 184(7). Although
18 the analytical data for Parcel 185(7) do not indicate contamination, it is recommended that this
19 parcel be included in the remedial investigation of Parcel 230Q-X because these parcels overlap
20 one another.

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ATTACHMENT 1

LIST OF ABBREVIATIONS AND ACRONYMS

List of Abbreviations and Acronyms

2,4-D	2,4-dichlorophenoxyacetic acid	AUF	area use factor	CESAS	Corps of Engineers South Atlantic Savannah
2,4,5-T	2,4,5-trichlorophenoxyacetic acid	AWARE	Associated Water and Air Resources Engineers, Inc.	CF	conversion factor
2,4,5-TP	2,4,5-trichlorophenoxypropionic acid	AWQC	ambient water quality criteria	CFC	chlorofluorocarbon
3D	3D International Environmental Group	AWWSB	Anniston Water Works and Sewer Board	CFDP	Center for Domestic Preparedness
AB	ambient blank	‘B’	Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero)	CFR	Code of Federal Regulations
AbB3	Anniston gravelly clay loam, 2 to 6 percent slopes, severely eroded	BCF	blank correction factor; bioconcentration factor	CG	phosgene (carbonyl chloride)
AbC3	Anniston gravelly clay loam, 6 to 10 percent slopes, severely eroded	BCT	BRAC Cleanup Team	CGI	combustible gas indicator
AbD3	Anniston and Allen gravelly clay loams, 10 to 15 percent slopes, eroded	BERA	baseline ecological risk assessment	ch	inorganic clays of high plasticity
Abs	skin absorption	BEHP	bis(2-ethylhexyl)phthalate	CHPPM	U.S. Army Center for Health Promotion and Preventive Medicine
ABS	dermal absorption factor	BFB	bromofluorobenzene	CIH	Certified Industrial Hygienist
AC	hydrogen cyanide	BFE	base flood elevation	CK	cyanogen chloride
ACAD	AutoCadd	BG	Bacillus globigii	cl	inorganic clays of low to medium plasticity
AcB2	Anniston and Allen gravelly loams, 2 to 6 percent slopes, eroded	BGR	Bains Gap Road	Cl	chlorinated
AcC2	Anniston and Allen gravelly loams, 6 to 10 percent slopes, eroded	bgs	below ground surface	CLP	Contract Laboratory Program
AcD2	Anniston and Allen gravelly loams, 10 to 15 percent slopes, eroded	BHC	hexachlorocyclohexane	cm	centimeter
AcE2	Anniston and Allen gravelly loams, 15 to 25 percent slopes, eroded	BHHRA	baseline human health risk assessment	CN	chloroacetophenone
ACGIH	American Conference of Governmental Industrial Hygienists	BIRTC	Branch Immaterial Replacement Training Center	CNB	chloroacetophenone, benzene, and carbon tetrachloride
AdE	Anniston and Allen stony loam, 10 to 25 percent slope	bkg	background	CNS	chloroacetophenone, chloropicrin, and chloroform
ADEM	Alabama Department of Environmental Management	bls	below land surface	CO	carbon monoxide
ADPH	Alabama Department of Public Health	BOD	biological oxygen demand	CO ₂	carbon dioxide
AEC	U.S. Army Environmental Center	Bp	soil-to-plant biotransfer factors	Co-60	cobalt-60
AEDA	ammunition, explosives, and other dangerous articles	BRAC	Base Realignment and Closure	CoA	Code of Alabama
AEL	airborne exposure limit	Braun	Braun Intertec Corporation	COC	chain of custody; chemical of concern
AET	adverse effect threshold	BSAF	biota-to-sediment accumulation factors	COE	Corps of Engineers
AF	soil-to-skin adherence factor	BSC	background screening criterion	Con	skin or eye contact
AHA	ammunition holding area	BTAG	Biological Technical Assistance Group	COPC	chemical of potential concern
AL	Alabama	BTEX	benzene, toluene, ethyl benzene, and xylenes	COPEC	constituent of potential ecological concern
ALARNG	Alabama Army National Guard	BTOC	below top of casing	CPSS	chemicals present in site samples
ALAD	δ-aminolevulinic acid dehydratase	BTV	background threshold value	CQCSM	Contract Quality Control System Manager
ALDOT	Alabama Department of Transportation	BW	biological warfare; body weight	CRDL	contract-required detection limit
amb.	amber	BZ	breathing zone; 3-quinuclidinyl benzilate	CRL	certified reporting limit
amsl	above mean sea level	C	ceiling limit value	CRQL	contract-required quantitation limit
ANAD	Anniston Army Depot	Ca	carcinogen	CRZ	contamination reduction zone
AOC	area of concern	CaCO ₃	calcium carbonate	Cs-137	cesium-137
AP	armor piercing	CAA	Clean Air Act	CS	ortho-chlorobenzylidene-malononitrile
APEC	areas of potential ecological concern	CAB	chemical warfare agent breakdown products	CSEM	conceptual site exposure model
APT	armor-piercing tracer	CACM	Chemical Agent Contaminated Media	CSM	conceptual site model
AR	analysis request	CAMU	corrective action management unit	CT	central tendency
ARAR	applicable or relevant and appropriate requirement	CBR	chemical, biological, and radiological	ctr.	container
AREE	area requiring environmental evaluation	CCAL	continuing calibration	CWA	chemical warfare agent; Clean Water Act
AS/SVE	air sparging/soil vapor extraction	CCB	continuing calibration blank	CWM	chemical warfare material; clear, wide mouth
ASP	Ammunition Supply Point	CCV	continuing calibration verification	CX	dichloroformoxime
ASR	Archives Search Report	CD	compact disc	‘D’	duplicate; dilution
AST	aboveground storage tank	CDTF	Chemical Defense Training Facility	D&I	detection and identification
ASTM	American Society for Testing and Materials	CEHNC	U.S. Army Engineering and Support Center, Huntsville	DAAMS	depot area agent monitoring station
AT	averaging time	CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	DAF	dilution-attenuation factor
ATSDR	Agency for Toxic Substances and Disease Registry	CERFA	Community Environmental Response Facilitation Act	DANC	decontamination agent, non-corrosive
ATV	all-terrain vehicle			°C	degrees Celsius

List of Abbreviations and Acronyms (Continued)

°F	degrees Fahrenheit	EPIC	Environmental Photographic Interpretation Center	g/m ³	gram per cubic meter
DCA	dichloroethane	EPRI	Electrical Power Research Institute	G-856	Geometrics, Inc. G-856 magnetometer
DCE	dichloroethene	ER	equipment rinsate	G-858G	Geometrics, Inc. G-858G magnetic gradiometer
DDD	dichlorodiphenyldichloroethane	ERA	ecological risk assessment	GAF	gastrointestinal absorption factor
DDE	dichlorodiphenyldichloroethene	ER-L	effects range-low	gal	gallon
DDT	dichlorodiphenyltrichloroethane	ER-M	effects range-medium	gal/min	gallons per minute
DEH	Directorate of Engineering and Housing	ESE	Environmental Science and Engineering, Inc.	GB	sarin (isopropyl methylphosphonofluoridate)
DEP	depositional soil	ESMP	Endangered Species Management Plan	gc	clay gravels; gravel-sand-clay mixtures
DFTPP	decafluorotriphenylphosphine	ESN	Environmental Services Network, Inc.	GC	gas chromatograph
DI	deionized	ESV	ecological screening value	GCL	geosynthetic clay liner
DID	data item description	ET	exposure time	GC/MS	gas chromatograph/mass spectrometer
DIMP	di-isopropylmethylphosphonate	EU	exposure unit	GCR	geosynthetic clay liner
DM	dry matter; adamsite	Exp.	explosives	GFAA	graphite furnace atomic absorption
DMBA	dimethylbenz(a)anthracene	E-W	east to west	GIS	Geographic Information System
DMMP	dimethylmethylphosphonate	EZ	exclusion zone	gm	silty gravels; gravel-sand-silt mixtures
DO	dissolved oxygen	FAR	Federal Acquisition Regulations	gp	poorly graded gravels; gravel-sand mixtures
DOD	U.S. Department of Defense	FB	field blank	gpm	gallons per minute
DOJ	U.S. Department of Justice	FD	field duplicate	GPR	ground-penetrating radar
DOT	U.S. Department of Transportation	FDC	Former Decontamination Complex	GPS	global positioning system
DP	direct-push	FDA	U.S. Food and Drug Administration	GRA	general response action
DPDO	Defense Property Disposal Office	Fe ⁺³	ferric iron	GS	ground scar
DPT	direct-push technology	Fe ⁺²	ferrous iron	GSA	General Services Administration; Geologic Survey of Alabama
DQO	data quality objective	FedEx	Federal Express, Inc.	GSBP	Ground Scar Boiler Plant
DRMO	Defense Reutilization and Marketing Office	FEMA	Federal Emergency Management Agency	GSSI	Geophysical Survey Systems, Inc.
DRO	diesel range organics	FFCA	Federal Facilities Compliance Act	GST	ground stain
DS	deep (subsurface) soil	FFE	field flame expedient	GW	groundwater
DS2	Decontamination Solution Number 2	FFS	focused feasibility study	gw	well-graded gravels; gravel-sand mixtures
DSERTS	Defense Site Environmental Restoration Tracking System	FI	fraction of exposure	H&S	health and safety
DWEL	drinking water equivalent level	Fil	filtered	HA	hand auger
E&E	Ecology and Environment, Inc.	FIt	filtered	HC	mixture of hexachloroethane, aluminum powder, and zinc oxide (smoke producer)
EB	equipment blank	FMDC	Fort McClellan Development Commission	HCl	hydrochloric acid
EBS	environmental baseline survey	FML	flexible membrane liner	HD	distilled mustard (bis-[dichloroethyl]sulfide)
EC ₅₀	effects concentration for 50 percent of a population	f _{oc}	fraction organic carbon	HDPE	high-density polyethylene
ECBC	Edgewood Chemical Biological Center	FOMRA	Former Ordnance Motor Repair Area	HE	high explosive
ED	exposure duration	FOST	Finding of Suitability to Transfer	HEAST	Health Effects Assessment Summary Tables
EDD	electronic data deliverable	Foster Wheeler	Foster Wheeler Environmental Corporation	Herb.	herbicides
EF	exposure frequency	FR	Federal Register	HHRA	human health risk assessment
EDQL	ecological data quality level	Frtn	fraction	HI	hazard index
EE/CA	engineering evaluation and cost analysis	FS	field split; feasibility study	H ₂ O ₂	hydrogen peroxide
Elev.	elevation	FSP	field sampling plan	HPLC	high-performance liquid chromatography
EM	electromagnetic	ft	feet	HNO ₃	nitric acid
EMI	Environmental Management Inc.	ft/day	feet per day	HQ	hazard quotient
EM31	Geonics Limited EM31 Terrain Conductivity Meter	ft/ft	feet per foot	HQ _{screen}	screening-level hazard quotient
EM61	Geonics Limited EM61 High-Resolution Metal Detector	ft/yr	feet per year	hr	hour
EOD	explosive ordnance disposal	FTA	Fire Training Area	HRC	hydrogen releasing compound
EODT	explosive ordnance disposal team	FTMC	Fort McClellan	HSA	hollow-stem auger
EPA	U.S. Environmental Protection Agency	FTRRRA	FTMC Reuse & Redevelopment Authority	HTRW	hazardous, toxic, and radioactive waste
EPC	exposure point concentration	g	gram	'I'	out of control, data rejected due to low recovery

List of Abbreviations and Acronyms (Continued)

IASPOW	Impact Area South of POW Training Facility	LC	liquid chromatography	MPA	methyl phosphonic acid
IATA	International Air Transport Authority	LCS	laboratory control sample	MPM	most probable munition
ICAL	initial calibration	LC ₅₀	lethal concentration for 50 percent population tested	MQL	method quantitation limit
ICB	initial calibration blank	LD ₅₀	lethal dose for 50 percent population tested	MR	molasses residue
ICP	inductively-coupled plasma	LEL	lower explosive limit	MRL	method reporting limit
ICRP	International Commission on Radiological Protection	LOAEL	lowest-observed-adverse-effects-level	MS	matrix spike
ICS	interference check sample	LRA	land redevelopment authority	mS/cm	millisiemens per centimeter
ID	inside diameter	LT	less than the certified reporting limit	mS/m	millisiemens per meter
IDL	instrument detection limit	LUC	land-use control	MSD	matrix spike duplicate
IDLH	immediately dangerous to life or health	LUCAP	land-use control assurance plan	MTBE	methyl tertiary butyl ether
IDM	investigative-derived media	LUCIP	land-use control implementation plan	msl	mean sea level
IDW	investigation-derived waste	max	maximum	MtD3	Montevallo shaly, silty clay loam, 10 to 40 percent slopes , severely eroded
IEUBK	Integrated Exposure Uptake Biokinetic	MB	method blank	mV	millivolts
IF	ingestion factor; inhalation factor	MCL	maximum contaminant level	MW	monitoring well
ILCR	incremental lifetime cancer risk	MCLG	maximum contaminant level goal	MWI&MP	Monitoring Well Installation and Management Plan
IMPA	isopropylmethyl phosphonic acid	MCPA	4-chloro-2-methylphenoxyacetic acid	Na	sodium
IMR	Iron Mountain Road	MCPP	2-(2-methyl-4-chlorophenoxy)propionic acid	NA	not applicable; not available
in.	inch	MCS	media cleanup standard	NAD	North American Datum
Ing	ingestion	MD	matrix duplicate	NAD83	North American Datum of 1983
Inh	inhalation	MDC	maximum detected concentration	NaMnO ₄	sodium permanganate
IP	ionization potential	MDCC	maximum detected constituent concentration	NAVD88	North American Vertical Datum of 1988
IPS	International Pipe Standard	MDL	method detection limit	NAS	National Academy of Sciences
IR	ingestion rate	mg	milligrams	NCEA	National Center for Environmental Assessment
IRDMIS	Installation Restoration Data Management Information System	mg/kg	milligrams per kilogram	NCP	National Contingency Plan
IRIS	Integrated Risk Information Service	mg/kg/day	milligram per kilogram per day	NCRP	National Council on Radiation Protection and Measurements
IRP	Installation Restoration Program	mg/kgbw/day	milligrams per kilogram of body weight per day	ND	not detected
IS	internal standard	mg/L	milligrams per liter	NE	no evidence; northeast
ISCP	Installation Spill Contingency Plan	mg/m ³	milligrams per cubic meter	ne	not evaluated
IT	IT Corporation	mh	inorganic silts, micaceous or diatomaceous fine, sandy or silt soils	NEW	net explosive weight
ITEMS	IT Environmental Management System™	MHz	megahertz	NFA	No Further Action
‘J’	estimated concentration	µg/g	micrograms per gram	NG	National Guard
JeB2	Jefferson gravelly fine sandy loam, 2 to 6 percent slopes, eroded	µg/kg	micrograms per kilogram	NGP	National Guardsperson
JeC2	Jefferson gravelly fine sandy loam, 6 to 10 percent slopes, eroded	µg/L	micrograms per liter	ng/L	nanograms per liter
JfB	Jefferson stony fine sandy loam, 0 to 10 percent slopes have strong slopes	µmhos/cm	micromhos per centimeter	NGVD	National Geodetic Vertical Datum
JPA	Joint Powers Authority	MeV	mega electron volt	Ni	nickel
K	conductivity	min	minimum	NIC	notice of intended change
K _d	soil-water distribution coefficient	MINICAMS	miniature continuous air monitoring system	NIOSH	National Institute for Occupational Safety and Health
kg	kilogram	ml	inorganic silts and very fine sands	NIST	National Institute of Standards and Technology
KeV	kilo electron volt	mL	milliliter	NLM	National Library of Medicine
K _{oc}	organic carbon partitioning coefficient	mm	millimeter	NO ₃ ⁻	nitrate
K _{ow}	octonal-water partition coefficient	MM	mounded material	NPDES	National Pollutant Discharge Elimination System
KMnO ₄	potassium permanganate	MMBtu/hr	million Btu per hour	NPW	net present worth
L	liter; Lewisite (dichloro-[2-chloroethyl]sulfide)	MNA	monitored natural attenuation	No.	number
L/kg/day	liters per kilogram per day	MnO ₄ ⁻	permanganate ion	NOAA	National Oceanic and Atmospheric Administration
l	liter	MOA	Memorandum of Agreement	NOAEL	no-observed-adverse-effects-level
LAW	light anti-tank weapon	MOGAS	motor vehicle gasoline	NR	not requested; not recorded; no risk
lb	pound	MOUT	Military Operations in Urban Terrain	NRC	National Research Council
LBP	lead-based paint	MP	Military Police	NRCC	National Research Council of Canada

List of Abbreviations and Acronyms (Continued)

NRHP	National Register of Historic Places	PFT	portable flamethrower	RI	remedial investigation
NRT	near real time	PG	professional geologist	RL	reporting limit
ns	nanosecond	PID	photoionization detector	RME	reasonable maximum exposure
N-S	north to south	PkA	Philo and Stendal soils local alluvium, 0 to 2 percent slopes	ROD	Record of Decision
NS	not surveyed	PM	project manager	RPD	relative percent difference
NSA	New South Associates, Inc.	POC	point of contact	RR	Range residue
nT	nanotesla	POL	petroleum, oils, and lubricants	RRF	relative response factor
nT/m	nanoteslas per meter	POTW	publicly owned treatment works	RSD	relative standard deviation
NTU	nephelometric turbidity unit	POW	prisoner of war	RTC	Recruiting Training Center
nv	not validated	PP	peristaltic pump; Proposed Plan	RTECS	Registry of Toxic Effects of Chemical Substances
O ₂	oxygen	ppb	parts per billion	RTK	real-time kinematic
O ₃	ozone	ppbv	parts per billion by volume	RWIMR	Ranges West of Iron Mountain Road
O&G	oil and grease	PPE	personal protective equipment	SA	exposed skin surface area
O&M	operation and maintenance	ppm	parts per million	SAD	South Atlantic Division
OB/OD	open burning/open detonation	PPMP	Print Plant Motor Pool	SAE	Society of Automotive Engineers
OD	outside diameter	ppt	parts per thousand	SAIC	Science Applications International Corporation
OE	ordnance and explosives	PR	potential risk	SAP	installation-wide sampling and analysis plan
oh	organic clays of medium to high plasticity	PRA	preliminary risk assessment	SARA	Superfund Amendments and Reauthorization Act
OH•	hydroxyl radical	PRG	preliminary remediation goal	sc	clayey sands; sand-clay mixtures
ol	organic silts and organic silty clays of low plasticity	PS	chloropicrin	Sch.	schedule
OP	organophosphorus	PSSC	potential site-specific chemical	SCM	site conceptual model
ORC	Oxygen Releasing Compound	pt	peat or other highly organic silts	SD	sediment
ORP	oxidation-reduction potential	PVC	polyvinyl chloride	SDG	sample delivery group
OSHA	Occupational Safety and Health Administration	QA	quality assurance	SDWA	Safe Drinking Water Act
OSWER	Office of Solid Waste and Emergency Response	QA/QC	quality assurance/quality control	SDZ	safe distance zone; surface danger zone
OVM-PID/FID	organic vapor meter-photoionization detector/flame ionization detector	QAM	quality assurance manual	SEMS	Southern Environmental Management & Specialties, Inc.
OWS	oil/water separator	QAO	quality assurance officer	SF	cancer slope factor
oz	ounce	QAP	installation-wide quality assurance plan	SFSP	site-specific field sampling plan
PA	preliminary assessment	QC	quality control	SGF	standard grade fuels
PAH	polynuclear aromatic hydrocarbon	QST	QST Environmental, Inc.	Shaw	Shaw Environmental, Inc.
PARCCS	precision, accuracy, representativeness, comparability, completeness, and sensitivity	qty	quantity	SHP	installation-wide safety and health plan
Parsons	Parsons Engineering Science, Inc.	Qual	qualifier	SI	site investigation
Pb	lead	R	rejected data; resample; retardation factor	SINA	Special Interest Natural Area
PBMS	performance-based measurement system	R&A	relevant and appropriate	SL	standing liquid
PC	permeability coefficient	RA	remedial action	SLERA	screening-level ecological risk assessment
PCB	polychlorinated biphenyl	RAO	remedial action objective	sm	silty sands; sand-silt mixtures
PCDD	polychlorinated dibenzo-p-dioxins	RBC	risk-based concentration; red blood cell	SM	Serratia marcescens
PCDF	polychlorinated dibenzofurans	RCRA	Resource Conservation and Recovery Act	SMDP	Scientific Management Decision Point
PCE	perchloroethene	RCWM	Recovered Chemical Warfare Material	s/n	signal-to-noise ratio
PCP	pentachlorophenol	RD	remedial design	SO ₄ ⁻²	sulfate
PDS	Personnel Decontamination Station	RDX	cyclotrimethylenetrinitramine	SOD	soil oxidant demand
PEF	particulate emission factor	ReB3	Rarden silty clay loams	SOP	standard operating procedure
PEL	permissible exposure limit	REG	regular field sample	SOPQAM	U.S. EPA's <i>Standard Operating Procedure/Quality Assurance Manual</i>
PERA	preliminary ecological risk assessment	REL	recommended exposure limit	sp	poorly graded sands; gravelly sands
PES	potential explosive site	RFA	request for analysis	SP	submersible pump
Pest.	pesticides	RfC	reference concentration	SPCC	system performance calibration compound
PETN	pentaerythritoltetranitrate	RfD	reference dose	SPCS	State Plane Coordinate System
		RGO	remedial goal option	SPM	sample planning module

List of Abbreviations and Acronyms (Continued)

SQRT	screening quick reference tables	TOC	top of casing; total organic carbon	WWII	World War II
Sr-90	strontium-90	TPH	total petroleum hydrocarbons	XRF	x-ray fluorescence
SRA	streamlined human health risk assessment	TR	target cancer risk	yd ³	cubic yards
SRM	standard reference material	TRADOC	U.S. Army Training and Doctrine Command		
Ss	stony rough land, sandstone series	TRPH	total recoverable petroleum hydrocarbons		
SS	surface soil	TSCA	Toxic Substances Control Act		
SSC	site-specific chemical	TSDF	treatment, storage, and disposal facility		
SSHO	site safety and health officer	TWA	time-weighted average		
SSHP	site-specific safety and health plan	UCL	upper confidence limit		
SSL	soil screening level	UCR	upper certified range		
SSSL	site-specific screening level	'U'	not detected above reporting limit		
SSSSL	site-specific soil screening level	UIC	underground injection control		
STB	supertropical bleach	UF	uncertainty factor		
STC	source-term concentration	USACE	U.S. Army Corps of Engineers		
STD	standard deviation	USACHPPM	U.S. Army Center for Health Promotion and Preventive Medicine		
STEL	short-term exposure limit	USAEC	U.S. Army Environmental Center		
STL	Severn-Trent Laboratories	USAEHA	U.S. Army Environmental Hygiene Agency		
STOLS	Surface Towed Ordnance Locator System®	USACMLS	U.S. Army Chemical School		
Std. units	standard units	USAMPS	U.S. Army Military Police School		
SU	standard unit	USATCES	U.S. Army Technical Center for Explosive Safety		
SUXOS	senior UXO supervisor	USATEU	U.S. Army Technical Escort Unit		
SVOC	semivolatile organic compound	USATHAMA	U.S. Army Toxic and Hazardous Material Agency		
SW	surface water	USC	United States Code		
SW-846	U.S. EPA's <i>Test Methods for Evaluating Solid Waste: Physical/Chemical Methods</i>	USCS	Unified Soil Classification System		
SWMU	solid waste management unit	USDA	U.S. Department of Agriculture		
SWPP	storm water pollution prevention plan	USEPA	U.S. Environmental Protection Agency		
SZ	support zone	USFWS	U.S. Fish and Wildlife Service		
TAL	target analyte list	USGS	U.S. Geological Survey		
TAT	turn around time	UST	underground storage tank		
TB	trip blank	UTL	upper tolerance level; upper tolerance limit		
TBC	to be considered	UXO	unexploded ordnance		
TCA	trichloroethane	UXOQCS	UXO Quality Control Supervisor		
TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin	UXOSO	UXO safety officer		
TCDF	tetrachlorodibenzofurans	V	vanadium		
TCE	trichloroethene	VC	vinyl chloride		
TCL	target compound list	VOA	volatile organic analyte		
TCLP	toxicity characteristic leaching procedure	VOC	volatile organic compound		
TDEC	Tennessee Department of Environment and Conservation	VOH	volatile organic hydrocarbon		
TDGCL	thiodiglycol	VQlfr	validation qualifier		
TDGCLA	thiodiglycol chloroacetic acid	VQual	validation qualifier		
TEA	triethylaluminum	VX	nerve agent (O-ethyl-S-[diisopropylaminoethyl]-methylphosphonothiolate)		
Tetryl	trinitrophenylmethylnitramine	WAC	Women's Army Corps		
TERC	Total Environmental Restoration Contract	Weston	Roy F. Weston, Inc.		
THI	target hazard index	WP	installation-wide work plan		
TIC	tentatively identified compound	WRS	Wilcoxon rank sum		
TLV	threshold limit value	WS	watershed		
TN	Tennessee	WSA	Watershed Screening Assessment		
TNT	trinitrotoluene	WWI	World War I		